

SYSTEM MANUAL

386



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LEO 
— COMPUTERS —

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PERSONAL COMPUTER

OPERATION MANUAL

DOC. NO : 91600 REV. : B
DATE : SEPTEMBER, 1989



FIRST INTERNATIONAL COMPUTER, INC.

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INTRODUCTION

The **LEO 386 system** is a true **32-bit** mode system designed to run not only with almost all available MS-DOS software and PC/AT hardware but also supports O/S 2, XENIX 386, UNIX V.3/MERGE/MS-DOS, CONCURRENT DOS 386, THEOS 386, PICK, PC-MOS/386 and a wide variety of 32-bit applications such as MS-Window 386, ORACLE Relational Database, AI, Expert System software, and CAD/CAM packages. Moreover, the **LEO 386 system** supports NOVELL NETWARE VMS, BANYAN VINES 386, 3COM Ethernet, most Local Area network operating systems and Micro to Mainframe links.

Up to 16MB of 32-bit memory may be added to permit effortless system integration for dedicated CAD/CAM workstations, Multiuser and LAN servers for high level office and factory automation. Because the **LEO 386 system** fully supports the 80387 numerical coprocessor, it is highly suitable for CAD/CAM and calculation intensive applications.

Finally, the most outstanding feature of the **LEO 386 system** is its Reliability, the system you have received has undergone rigorous and stringent tests to ensure you years of trouble-free use. The purpose of this operation manual is to provide you the information on how to configure your system. In addition, this manual will provide you with the expertise in understanding the standard specifications you need to optimize the functions of the system. Please read through each chapter with care and actually enjoy your work by using the high performance **LEO 386 system**.

CAUTION

To ensure user's safety, we recommend that the power of this product must be connected with a well-grounded power receptacle to avoid possible electrical shock.

TRADEMARKS

LEO 386 is a trademark of

First International Computer, INC.

The following marks that will be mentioned later in this manual are all registered trademarks, such as IBM PC, INTEL, MS-DOS, THEOS 386, PC-MOS/386, ORACLE Relational Database, AI, Xenix-386, O/S 2, 3COM Ethernet, CONCURRENT DOS 386, PICK, NOVELL NETWARE VMS, BANYAN VINES 386 and UNIX V.3/LOCUS MERGE/MS-DOS.

FCC WARNING STATEMENTS

WARNING:

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

CLASS A COMPUTING DEVICE: Information to users

The description followed by this page can be used to provide the required information concerning the interference risk of the device and some simple measures to correct the interference. Any language that conveys the same meaning and can be understood by an average person without a technical education may be used.

FCC WARNING STATEMENTS

WARNING:

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

CLASS B COMPUTING DEVICE: Information to users

The following language may be used to provide the required information concerning the interference potential of the device and simple measures that can be taken by the user to correct any interference. Any language that conveys the same meaning and can be understood by an average person without a technical education may be used. This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instruction, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does not cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

PREFACE

"CHAPTER 1. SYSTEM"

This chapter presents to you the system configurations that you might need to know. Also familiarizes you with both the system unit and peripherals.

"CHAPTER 2. SET UP"

This chapter helps you to install and configure your **LEO 386 SYSTEM**.

"CHAPTER 3. KEYBOARD"

In this chapter, we will briefly explain the basic function of the keyboard, which we believe might be useful for you.

"CHAPTER 4. DOS"

Due to the popularity of MS-DOS, we believe it is essential to provide the basic function of MS-DOS to our users.

"APPENDIX A. HARD DISK"

How to install a hard disk? Here we provide you the installation procedures of both hardware and software for hard disk.

"APPENDIX B. MAP"

To apply the system software, this section provides the hardware information necessary for the advanced user.

"APPENDIX C. ADAPTER"

We provide all the necessary parts for the **LEO 386 SYSTEM**, however, you might still prefer to install your own peripheral cards. This part provides the necessary installation procedures on how to install a new adapter.

"APPENDIX D. TROUBLE SHOOTING"

This chapter gives some methods on isolating the troubles that might confuse you.

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CHAPTER 1

SYSTEM

1.1 SYSTEM UNIT

The system unit consists of the system board, power supply, adapter cards, disk drives, the microprocessor, **RAM**, **ROM** and the support chips, all enclosed in a floor-standing tower case.

On the front panel there is one power switch, three indicator **LEDs**, one **RESET** button, one toggled speed switch and one system lock switch. When you push the power switch to "ON" position, the power **LED** on the power switch lights up to indicate that the system is now running. When the power is on, please do not remove anything from the system unit to prevent accidental equipment damage.

The **red LED** is used to indicate the action of the hard disk. The light is on when the fixed drive is accessed. And the light will go off whenever the fixed drive is not being accessed. Note that you should not move the system unit with a fixed drive when the fixed drive is on because it may destroy the data of the fixed drive.

Some special software packages can run only at slower speed. The **LEO 386 system** supports this feature by both software and hardware. The **green LED** indicates the clock frequency of the system. When the light goes on, this means the system is running at **high speed** whereas when the light goes off, it indicates the system is running at **low speed**. The toggled switch between the red and the green **LED**. Pressing the speed switch will cause the clock frequency of the system to toggle between **high speed** and **low speed** so that you can run all the programs.

To use the system, first use the key shipped with the system unit to unlock the system and the keyboard. This function prevents any unauthorized access to the system, and also keeps the data safe.

The **RESET** button on the front panel is to restart the system without turning off the power switch. To reboot the system, press the **RESET** button.

1.2 REAR PANEL CONNECTORS

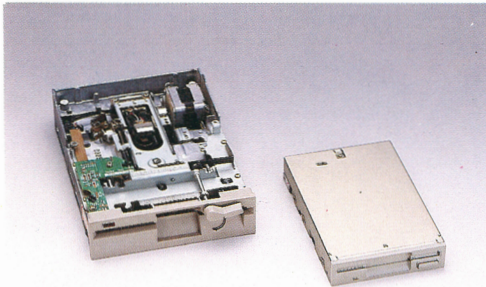
Here we'll show you the function of each connector in the rear panel. There is one voltage switch and two three-prong sockets at the back of the system, one is male and the other is female. The male one is used for attaching with the system power cord. The female one is normally used to support the power cord of the monitor. Another switch is to control the acceptance of the input voltage. Be sure that the switch is in **PROPER** position. And there is a keyboard connector.

The following is the orientation of the rear panel.

1.3 FLOPPY DISK DRIVE (FDD) and FLOPPY DISKETTE

There are two types of disk drives that LEO 386 supports, 5 1/4-inch and 3 1/2-inch. In the standard system, we provide you one 1.2MB 5-1/4 inch floppy disk drive. Others are optional.

Below are pictures of the two different types of disk drives:



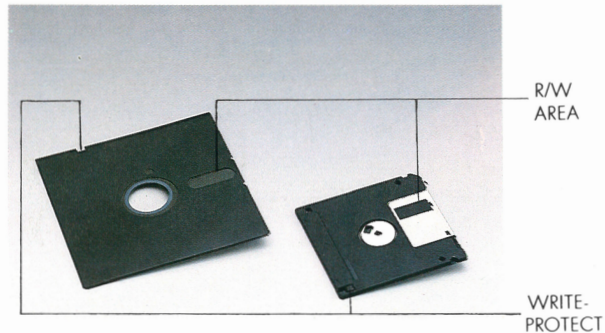
THE FLOPPY DISK DRIVE

The left one is a 5 1/4-inch disk drive, the right one is a 3 1/2-inch disk drive. Here you may see the differences between them.

THE FLOPPY DISKETTE

The densities of the most common floppy diskettes for the 5 1/4-inch system that we use are 360KB and 1.2MB. The densities of the 3 1/2-inch system are 720KB, 1.44MB. With the standard **LEO 386 system**, you may use either 2D or 2HD floppy diskettes of 5 1/4-inch size.

Below are pictures of the 5 1/4-inch and 3 1/2-inch diskettes for your reference:



THE FLOPPY DISKETTE

1.4 THE HARD DISK DRIVE (HDD)

The hard disk drive, like the floppy disk drive, has two different specifications of 5 1/4-inch and 3 1/2 -inch. Both the floppy disk and the hard disk are the auxilliary storage of the system with the **HDD** having a much larger capacity. The data access speed of the **HDD** is faster than the **FDD**. To make full use of the **LEO 386 system**, you should consider having a **HARD DISK DRIVE**.

The **LED** on the front panel monitors the action of the hard disk and will light up when the hard disk is in use.

1.5 KEYBOARD

The keyboard used with the system is a standard 102-keyboard. For different countries, we also provide different drivers for your convenience. For further descriptions, please refer to **CHAPTER 3**.

1.6 MONITOR

Monochrome Display

Always be sure to check the video and power cables on your monitor to make sure they are connected correctly to the system unit and plugged into a working power source before you turn on the power switch.

- The Contrast control can be used to increase or decrease the quality and intensity of the resolution on your display screen.
- The Brightness control can be used to increase or decrease the brightness of the entire display screen.

Color Display

When the power control on the color monitor is turned in a clockwise direction, power will be applied to the monitor. Turning the power control in a counterclockwise direction will power off your color monitor. This procedure may vary depending on the type and make of color monitor that you are using. If the power on procedure for your monitor differs from the one listed here, refer to your monitor's operations manual before proceeding any further.

Instructions on using the brightness and contrast controls for your color monitor are the same as for the monochrome monitor. Again if there is any difference, refer to your monitor's operations manual for further information.

Vertical Hold Adjustment

- Refer to this section if your monitor display is in a continuous roll condition. Some examples of a continuous roll condition might be caused by outside electrical interference or having your monitor located too close to your system unit, or using unshielded power cables.
- First, power off your entire PC system (system unit, monitor, and peripherals).
- Refer to your monitor's operating manual for the location of the vertical hold control on your monitor. Turn the control first in a clockwise direction to see if the rolling condition stops. If the rolling does not stop, then turn the control in a counterclockwise direction; until the rolling has stopped and the display has steadied.

Vertical Display Adjustment

- Adjustment of the vertical display on your monitor is necessary only if the size of the figures and characters on the display are irregular.
- Your system should still be powered off, so it is only necessary for you to power on your monitor. If your system is powered on, then power off everything except your monitor. Be sure the brightness and contrast controls on the monitor are turned as far as they will go in a clockwise direction.
- Refer to your monitor's operations manual for the location of the vertical display control. Turn the control in a counterclockwise direction. Once you start to turn the control, watch the display on your monitor for a black line which will be running across the top and the bottom of your display screen.
- Now begin to turn the vertical display control in a clockwise direction until the black lines at the top and bottom of the screen disappear. If both of these lines disappear, then your monitor should be working all right. If one or both of the lines do not disappear, continue to turn the vertical display control until they do.
- It may be necessary at this point to adjust the brightness and contrast controls on your monitor display to acquire a more suitable display resolution.

1.7 PRINTER

Printer operating procedures are remarkably the same except for the driver specifications in speed, character size, and clarity, etc. For specific informations on your printer, refer to the printer's operator manual.

Printer Compatibility

Both the **LEO SYSTEM** and the printer should use the same method of communication, **parallel or serial**. The default port that the **LEO SYSTEM** senses for the printer is the parallel port. Both the serial and the parallel ports are in the rear of the system unit. Every time when you turn on the computer, you must change the assumption if you plan to use a serial printer.

Further informations on program-controlled printer functions like subscript, margin justification, underlining, and font selection, depend on the type of printer you've selected. The program controls these functions by sending certain sequences of nonprinting characters to the printer. Different printers, might use different codes, so please refer to your printer manual before you send the codes.

The Printer Control

A typical printer has a power switch, a few buttons for manual control, and several status lights on the top or at the front of the printer in a control panel. Sometimes the power switch is located on the side or at the back of the printer. Other control switches and levers might be located inside of the printer.

Most printers know how far the current print line is from the bottom of the page and will eject the page at the press of a button. With continuous paper, the printer automatically advances to the top of the next page. For this feature to work properly, you must align the paper before you turn the printer on, thereby giving the printer a place to start from. Some printers have a button you can push to establish the current line as the top of the page.

Some printers have a switch labeled "auto line feed" or "local line feed". The switch may be on the front panel or it may be under the printer's top cover.

Common Printer Controls and Status Lights

NAME	FUNCTION
Switch and buttons	
Power	Turn the printer on and off
Online (Slect)	Suspend/resume printing
Form Feed (FF)	Advance paper to next page
Line Feed (LF, Paper adv)	Advance paper on line
Clear (Reset)	Reset printer after error
Override	Acknowledge paper out; finish printing this page
Status lights (when lit)	
Power	Power on
Ready	Printer ready interlocks and safety switches check ok
Select (on line)	Printing may proceed
Paper Out (Paper)	No more paper
Alarm (Error)	Ribbon but or internal error

Getting Ready to Print

When preparing to print, the first thing is to select the right paper, continuous form for continuous printing, multiple-part for carbon copies, label stock for mailings, and so on. For printing a one page document, you can use single-sheet stationery if your printer permits it. Once selected, put the paper in the printer, and align the position of the paper vertically and horizontally.

Next, check the ribbon for alignment and wear; install a new one if needed. If your printer has interchangeable type elements (daisy wheels or thimbles), make sure the correct one is securely installed. Set printing density or copies to accommodate the type of paper that you are using.

Finally, close all the printer covers and guards. Open cover activate interlock switches that will temporarily disable the printer. Turn the power switch on and set on the **"Select"** or **"Online"** switch if there is one. The **"Ready"** and **"Select"** status lights must be lit for the printer to work.

1.8 I/O SLOTS

To enhance the function beyond the standard system, you may need different add-on cards. The interface or media to communicate with the system are the **I/O** slots.

2 SET UP

CHAPTER 2

SET UP

2.1 UNPACKING

On receiving your computer system, please check that the packaging is in good condition. Otherwise, contact your distributor immediately.

Be careful while unpacking the system unit, keyboard, peripherals, cables, etc. Do not use a pointed or sharp instrument to open the packing box, as this may pierce the protective covering and scratch the machine. Check the following items and make sure they are in good condition. Also check the items with other optional units that you bought separately.

- A. The system unit**
- B. One keyboard**
- C. Two keys for the system unit**
- D. One power cord**
- E. One utility diskette**
- F. One copy of this manual**
- G. Two slides and six screws for disk driver**

Save all the boxes and the packing materials as you may need to use them for repacking when you move your computer system.

Note :

The **LEO 386 system** accepts two levels of voltages. At the rear part of the system unit and in the right of the female output power socket, there is a switch to set the voltage to 115V or 230V. Before turning on the computer, check if the switch is set for the right voltage.

2.2 INSTALLATION

Please follow the instructions and pictures described in the following pages to enable your system to work.

Note :

Before you make any connections, make sure that the power switches are turned to **OFF**. Connecting your system while the power is on may damage your computer system or peripheral devices.

1. Be sure the power switch on the front panel of system unit is in "**OFF**" position.
2. Remove the system unit, monitor and keyboard carefully from the cartons.
3. If your system has a monochrome monitor, Connect the signal cable of the monitor to the 9-pin female connector of the monochrome display adapter which is in the rear panel. Fasten the two screws on the cable to the adapter
4. Plug the power socket of the monochrome display monitor into the female **OUTPUT** power socket at the top of the rear panel. Or refer to the manual shipped with the monitor for connection instructions

5. Connect the keyboard connector with the interface in the back of the system provided by the system unit.
6. Connect the power cord by inserting the female side with the system **INPUT** power socket. The male side should be plugged into the wall outlet.
7. Insert the key into the system lock and turn it to the "**UNLOCK**" position.
8. Remove the head protective insert from the disk drive.
9. Insert your system diskette in drive A, then close the drive door by turning the lever downwards.
10. Again, check and set the correct voltage of the power selector switch. After that, you may turn on the power switch located in the front panel to power up the system.

Be careful not to press any key immediately after turning on the computer. The keyboard error message will come on if any keystroke is detected by the system while booting up the system.

If you forget to insert the system diskette into drive A, after the system boots up, the following messages will be displayed on the screen:

**DISK BOOT FAILURE, INSERT SYSTEM DISK
AND PRESS ENTER**

Insert the system diskette into drive A and press "ENTER". After a few seconds, you'll see the message of current date & time.

2.3 INSTALLING A PRINTER

There are two types of printers, one is the serial printer and the other is the parallel printer. So before you connect them, please check the printer manual for the specifications.

For a **PARALLEL** printer, please connect the printer cable to a parallel connector (**FEMALE**).

For a **SERIAL** print, please connenct the printer cable to a serial interface (**RS-232**) connector (**MALE**).

Note :

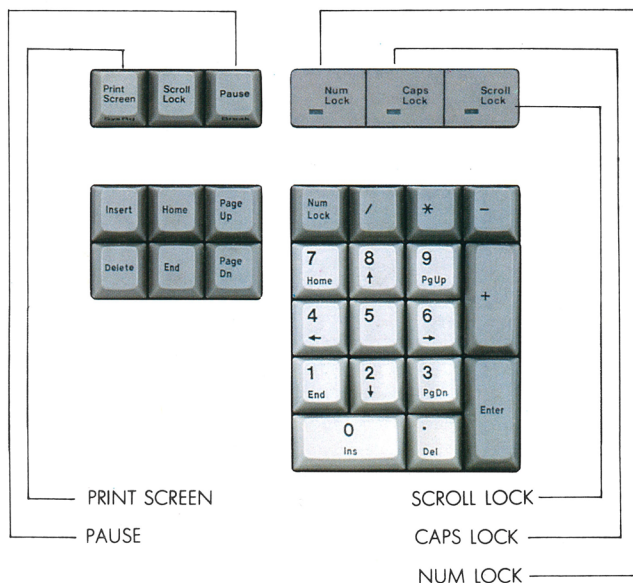
DO NOT connect a parallel printer with a serial port, for this will damage your system or printer. Before the system unit boots up, make sure the power of the printer or other peripherals are on to avoid the damage of an accidental current surge from the powering on of the printer.

CHAPTER 3

KEYBOARD

3.1 KEYBOARD INDICATORS

At the upper-right corner of the keyboard, there are three status indicators. From the left to the right, they are **CAPS LOCK**, **NUM LOCK**, and **SCROLL LOCK**.

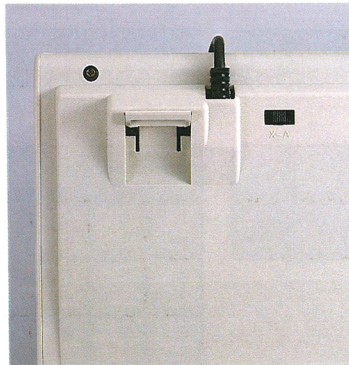


KEYBOARD PORT

3.2 ADJUSTING THE KEYBOARD

The keyboard can be adjusted to two different working positions for the user's comfort.

Located under the keyboard, in the upper-left and upper-right parts are two adjustable legs. These legs can be either pulled out or pushed in to enhance typing comfort.



THE KEYBOARD STAND

3.3 TYPEWRITER KEY DIVISION

The keyboard can be generally separated into four parts, **TYPEWRITER KEYS**, **NUMERIC KEYPAD**, **CURSOR CONTROL KEYS** and **FUNCTION KEYS**.

The **TYPEWRITER KEY DIVISION** is the main part of keyboard and that is used for entering most of the alphanumeric text.

Just like the typewriter, the special characters and punctuation marks, must be used with the **SHIFT** key. The other special functions of this part will be discussed later in this chapter.



TYPEWRITER KEY DIVISION

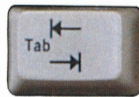
There are several **NON-CHARACTER** keys which will not display anything while pressing them.



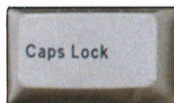
The **RETURN** key is a special key which will not display anything, yet it is equivalent to the **CARRIAGE RETURN** of the typewriter. Whenever you press it, the cursor will be moved to the beginning of the next new line.



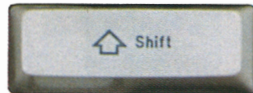
<-- The **BACKSPACE** key just like the backspace key of the typewriter is used to move the cursor backwards or one character left of its current position. But in some software applications, it will delete the character at the position where the cursor is.



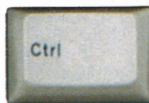
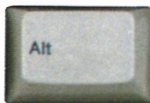
The **TAB** key will shift eight spaces to the right when you press it. And if you press the key while holding the **SHIFT** key, it will shift the cursor and change the direction to the left.



The **CAPSLOCK** key, unlike the other keys in this area, will change the character's status in toggle mode. When the **CAPSLOCK** indicator light is "ON", alphabetic characters will be entered in uppercase form. Conversely, when the **CAPSLOCK** indicator light is "OFF", alphabetic characters will be entered in lowercase form. The **CAPSLOCK** key is controlled by pressing once for "ON" and pressing a second time for "OFF".



Whenever you press the **SHIFT** key and another key simultaneously in this typewriter key area, the keys will automatically change into uppercase from lowercase. The two **SHIFT** keys in this area have the same function.



There are three particular keys that perform specific functions or certain commands, they are **CTRL**, **ALT** and **MACRO** keys. They will be defined as different functions depending on the software structure itself. Please refer to the instructions related to the software and the usage of the operation system that you are using for more detailed information.

3.4 THE NUMERIC KEYPAD

The right part of the keyboard is the numeric keypad. All the keys can be in either **NUMERIC** or **CURSOR CONTROL** mode, depending on the mode specified. The **DEFAULT** functions of these keys is the **CURSOR CONTROL**, i.e., unless you press the **NUM LOCK** key, the keys will be automatically set in the **CURSOR CONTROL** mode each time you restart the system.

Note the functions of the keys in this area is related to the particular software being used.



NUMERIC KEYPAD

The **CURSOR CONTROL** mode is the **DEFAULT** mode as we discussed in the previous page. The following descriptions are all the keys in the **CURSOR CONTROL** mode.

The **CURSOR** is the blinking mark that indicates the current position of your next entry. The **CURSOR CONTROL** keys allow you to choose the direction of the cursor's movement. (**UP**, **DOWN**, **LEFT** and **RIGHT**)



The **CURSOR UP** key moves the cursor up one line at a time.



This key which is called "**CURSOR DOWN**" moves the cursor down one line at a time.



This key, called "**CURSOR RIGHT**" moves the cursor one space right each time you press it.



The "**CURSOR LEFT**" key moves left one space at a time when it is pressed.



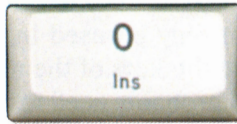
The "**HOME**" key moves the cursor to the top-left corner from the current position that it is in.



The function of the " **END** " key is dependent on the definition of the application software.



The definitions of " **PAGE UP** " and " **PAGE DOWN** " keys are dependent on the software applications. Yet they control the cursor's movement in either one-page up or one-page down.



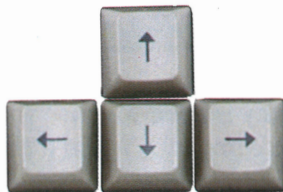
The "**INSERT**" key is used to insert character(s) anywhere in a line. When a character is inserted, all the data to the right of the cursor will be shift one space to the right. In some applications, this key will cause the cursor status shown on the screen to display "**INSERT ON**" in toggle mode. That is, you can press this key again to exit from **INSERT** mode.



The "**DELETE**" key is used to erase the character in the position where the cursor is. When a character is deleted from the line, all the characters to the right of the cursor will move one space left.

3.5 THE CURSOR CONTROL KEYS

The **CURSOR CONTROL** keys differ from the numeric keypad in that it can only be used in the cursor control mode. While you use the keys of the numeric keypad in a numeric mode, you'll probably need to move the cursor for editing, then this area supports you to move the position of the cursor without having to exit from the numeric mode. Also, the definitions of these keys are just the same as the numeric keypad in a **CURSOR CONTROL** mode.



CURSOR CONTROL KEYS

3.6 THE FUNCTION KEYS

All the definitions of the function keys at the upper part of the keyboard are dependent on the application software. Please refer to the user's reference manual of the operating system for more details.



FUNCTION KEYS

3.7 MULTI-KEY COMMANDS

The following are multi-key sequences for control functions.

- **System Restart** reloads your program.

Press and hold the Ctrl and Alt keys simultaneously. Then press the Del key to restart your system warm.

CTRL + ALT + DEL = System Restart.

- **Control Break** will automatically stop the program that is running and identify the line where the break or stop command was issued.

Press and hold the Ctrl key. Press the Scroll Lock key to issue a controlled break in your program.

CTRL + SCROLL LOCK = Stop

- **"Pause"** stops your program by placing it in a wait state.

Press and hold the Ctrl key. Press the Num Lock key which will cause the program to stop and issue a pause statement internally within the program. When you are ready to start running your program again, press any key to continue.

CTRL + NUM LOCK = Pause (Wait State)

CHAPTER 4

DOS

4.1 INTRODUCTION

The disk operating system or **DOS**, is a program that coordinates all the activities of the disk. To be acquainted with the computer, you must know how to operate it to do the things that you want to do. And that is exactly what **DOS** offers you. For this reason, herein we will give you some of the most common commands of the **MS-DOS** (Microsoft disk operating system).

4.2 BOOTING UP THE SYSTEM

What the system does while booting is to load the Disk Operating System (**DOS**) into system memory. So insert the system diskette of **MS-DOS** into drive A before you turn on the power of the system unit. If your system contains a fixed drive that has been properly formatted with the operating system installed on it, then skip the above step and just turn on the power.

During the power up, the system will check the configurations of the system and the parity of memory for defects. For this reason, the system will take some time during the booting-up. And the time is depending on how much memory is installed. The more memory, the longer it will take.

After the system boots up, you will see some messages shown on the screen.

For example:



```
Current date is Sun 9-06-1989  
Enter new date ( mm-dd-yy ) :
```

If you want to use the current date as shown on the screen, just press **"RETURN"** or **"ENTER"** key. Or set a new date by entering any of the following formats,

TYPE	EXAMPLE
mm-dd-yy	9-28-87
mm-dd-yyyy	9-28-1987
mm/dd/yy	9/28/87
mm/dd/yyyy	9/28/1987

After you type the date and press **"RETURN"** key, the new date will be automatically saved in the **CMOS RAM** and the operating system will add the day of the week for you. So September 28, 1989 will be displayed as Mon 9-28-1989.

You might prefer different sequences to input these data. To modify the sequence, you may copy the system diskette to another with the **SELECT** command. For more information, please see the manual Supplement to the **MS-DOS** Operating System User's Guide.

If no error message occurred, you will see the messages as follows:



Current time is 16:30:37.00
Enter new time:

The time is sixteen hours, thirty minutes and 37.00 seconds. You may either enter a new time or skip it by pressing the "RETURN" key. Please enter the time in 24-hour type. The colons are used to separate the hour, minute and second.

If all the data that you entered were correct, you will see the information of the operating system such as the copyright of the operating system, version number, etc., followed by the system prompt.

4.3 FILES

MS-DOS uses a sort of filing system to keep track of all the separate blocks of information. It treats each disk as a filing cabinet, and each file on it as a file drawer. In fact, blocks of information on a disk are called files.

The files are grouped into these two classes according to the type of information: program files and data files. A program file contains instructions that tell the computer how and what to execute. A data file contains an organized collection of facts and figures about a specific subject or topic.

The higher the capacity of the disk, the more independent blocks there are likely to be on the disk. A winchester disk may have several hundred.

File Name

Each disk file has a unique name. The filename could be any except those already being used. The name should follow the rules shown on next page. The name must have at least one character, or can have as many as eight, and a optional suffix. The suffix, called a file name extension, consists of a period followed by no more than three characters.

- MS-DOS File Name Rules

Permissible characters	Prohibited names
Letters A to Z	CON AUX COM1
Numerals 0 to 9	LPT1 PRN NUL
These symbols:	CON: AUX: COM1:
! @ # \$ % & () { } - _ \ ,	LPT1: PRN: NUL:

MS-DOS treats upper and lower case letters alike, so you can type a file name in any mixture of upper and lower case letters.

If you specify a file name with more than eight characters and no extension, **MS-DOS** will automatically delete the extra characters. **MS-DOS** accepts only 8 characters for the file name and 3 characters for extension. No error or warning messages will appear.

Generic File Name

At times it will be convenient to refer to a group of files all at once, rather than one at a time. You can use two special characters, **?** and *****, to specify generic filenames. Generic filenames are also called global filenames and ambiguous file-names.

A question mark represents a single ambiguous character within a file name. Thus filename **TEST1. BAS**, **TEST2.BAS**, **TEST3.BAS**, and **TEST4.BAS** all match the generic file name **TEST?.BAS**, but the file names **TEST10.BAS** and **TEST153.BAS** do not.

An asterisk represents any number of ambiguous characters. For example, **TEST*.*** will match any file that begins with **TEST**. However, an asterisk is only meaningful when used as the last character of a file name or extension.

Drive Designation

All files on a disk must have different names, but the same file name may be used on different disks. Therefore it is possible for a multiple drive system to have two or more disks with the same file names. To resolve the ambiguity, you can prefix the file name with the drive name (**A**, **B**, **C**, etc) and a colon. Thus **B:TEST.BAS** specifies a file on drive **B**.

On a single drive system, only drive A exists and there is no need to use a drive name prefix with file names. **MS-DOS** will automatically use the only available drive. If you do designate the drive, use only A:.

You can omit the drive designation on a multiple drive system too. This is possible because **MS-DOS** keeps a log of which drive to use by default, called the logged drive, or the default drive. Initially, **MS-DOS** logs drive A or C to use in case of default, as indicated by the command prompt, A or C.

Directory

Files are kept in directories on a disk. These directories also contain information on the size of the files, the location on the disk, and the dates in which they were created and updated. The directory you are working in is called the current or working directory.

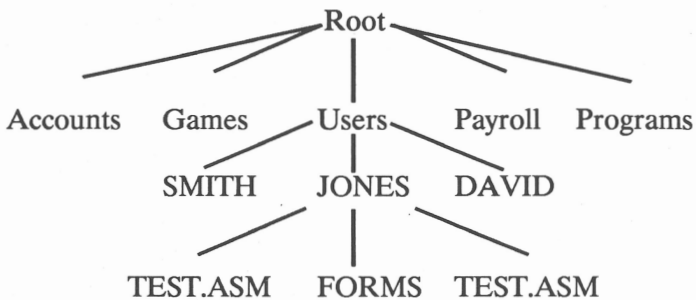
An additional system area is called the file allocation table. It keeps track of the location of disk files. It also allocates the free space on your disks so that you can create new files.

These two system areas, the directories and the file allocation table, enable **MS-DOS** to recognize and organize the files on your disks. The file allocation table is created when you format it with the **MS-DOS FORMAT** command and in the same process one empty directory, called the root directory is created.

In an office, you can separate files by putting them in different filing cabinets, creating in effect different directories of information. **MS-DOS** allows you to organize the files on your disks directories. Directories are a way of dividing your files into convenient groups of files. For example, you may want all of your accounting programs in one directory and test files in another. Any directory may contain a reasonable number of files, and it may also contain other directories (referred to as sub-directories). This method of organizing your files is called a hierarchical directory structure.

A hierarchical directory structure can be considered as a "**tree**" structure: directories are branches of the tree and files are the leaves, except that the "**tree**" grows downward and that the "**root**" is at the top. The root is the first level in the directory structure. It is the directory that is automatically created when you format a disk and start putting files in it. You can create additional directories and subdirectories by following the instructions in this chapter.

- illustrates a typical hierarchical directory structure:



JONES, **SMITH**, and **DAVID** each have their own directories which are subdirectories of the **USERS** directory. **SMITH** has a subdirectory under the **\USERS\SMITH** directory named **FORMS**. Note that the backward slash mark (\) is used to separate directories from other directories and files. **SMITH** and **DAVID** each have files in their directories, named **TEST.ASM**.

Note :

The maximum number of files or directories that the root directory may contain varies, depending on the type of disk and disk drive you are using. Usually, the maximum number is 112 for a double-sided, double-density, 5.25-inch floppy disk. The maximum number of entries in the root directory of a 1.44MB 3.5-inch floppy disk is 224. This maximum capacity for a root directory may vary depending upon how the disk is formatted. The number of subdirectories on a disk is not restricted.

The organization of files directories is not important if you only work with files in your own directory; but if you work with someone else or on several projects at one time, the hierarchical directory structure becomes extremely useful. For example, you could get a list of the files from SMITH's FORMS directory simply by typing:

DIR \USERS\SMITH\FORMS

A pathname is a sequence of directory names followed by a simple filename, each separated from the previous one by a backward slash \. The pathname of the SMITH's TEST.ASM file is \USERS\SMITH\TEST.ASM. If a pathname begins with a slash, MS-DOS searches for the file beginning at the root (or top) of the tree. Otherwise, MS-DOS begins at the user's current directory, known as the working directory.

4.4 MS-DOS COMMANDS

MS-DOS has many commands to help you keep your disks in order. There are commands which work on whole disks, individual files, the disk directory, the system time and date, and more. You issue commands to **MS-DOS** by typing certain words and symbols on the keyboard.

As you type a **MS-DOS** command on the keyboard, the display screen echoes what you typed. You then press the **ENTER** key and **MS-DOS** will execute the typed command. You can use any mixture of lower case and upper-case letters in command words.

Internal and External Commands

The **MS-DOS** program contains step-by-step instructions that tell the computer to carry out various commands. These are called resident or internal commands, because the instructions for doing them are inside the **MS-DOS** program itself. If you type a command that the **MS-DOS** cannot find among its set of resident commands, then it looks on the disk for a file that has the same name as the command, with an extension of **BAT**, **COM**, or **EXE**. If it finds the right file, it transfers instructions from the file to read/write memory and executes them. Such commands are called transient or external commands, because the instructions do not permanently reside in the **RAM**.

Generally, **MS-DOS** searches through the transient commands in the default drive. However, you can prefix the command with a drive designation to specify which drive **MS-DOS** should search on. If **MS-DOS** can not find instructions for the transient command, it displays the message "**Bad command or file name.**" You must reissue the command, making sure that the command file exists on the drive specified.

Correcting Mistakes

Before you press the **ENTER** key to execute a command, check if you have typed correctly. If any mistakes occur, use the backspace key to move the cursor to the beginning of the incorrect portion. Then retype the command. You may also use the **ESC** key to erase the whole line you were typing, and moves the cursor to the beginning of the next display line. It does not display another command prompt.

Canceling a Command

If you accidentally type and execute the wrong command and wish to terminate it, press the **Ctrl and Scroll Lock Keys** simultaneously. The **MS-DOS** command prompt (for example, **A**) will appear.

Changing the Default Drive

Initially, **MS-DOS** uses the boot-drive as the default drive. To use a different drive as default, type the letter of the new drive, then a colon, and finally press the **ENTER** key. A new **MS-DOS** command prompt appears on the display screen, indicating which drive is now logged for default use. Here is an example that switches from drive **A** to drive **B**.

Example:

```
A > B: (ENTER)
B >
```

4.5 SYSTEM PROMPT

The default system prompt will be set either A> or C> depending on the booting (active) drive. If you start the system with the system diskette of **MS-DOS** in drive A, the system prompt will be A indicating the default drive is A. If you have a system which contains a hard disk with **DOS** system, it will boot up to system prompt C> automatically without the system diskette in drive A.

If you want to change the active drive, drive B for instance, simply type

B:

then press "**RETURN**" key. The prompt will now become:

B>

Note:

If your system is a one-FDD (Floppy Disk Drive) system, the drive A and B will be the same one.

With two-FDD and one fixed drive system, the **FDD** are indicate as drive A and B and the fixed drive as C.

Now the system is ready to take your orders, we suggest you to make backup copies of the system diskettes to avoid problems if you should lose the originals.

Please follow the instructions below to make backup copies:

A. With one-floppy system, do as follows:

1. Format two blank diskette with the **FORMAT** command.
2. Copy all the files from the system diskette to the formatted diskette by using the **COPY** command.
3. Use the **COMP** command to confirm whether the files are correctly duplicated.

B. With two-floppy system, please do as follows:

1. Insert the system diskette into drive A and blank diskette into drive B.
2. Copy all files from drive A to drive B with **DISKCOPY** command.
3. Use the **DISKCOMP** command to confirm whether the files are correctly duplicated.

Detailed descriptions of the commands will be explained in the following sections.

4.6 FORMAT A DISKETTE

Note :

1. Before formatting a diskette or a hard disk, please insure that you really do not want to save the existing data. If there is any data that you will need later, please make a backup copy before using this **FORMAT** command.
2. To prevent accidental loss of data, you should put a tab on the write-protect notch.

A diskette will not be recognized by the system unless it has been properly formatted. To format a diskette, first insert the system diskette into drive A and type:

FORMAT B:/S

These characters can be written in uppercase or lowercase, or combinations of the two.

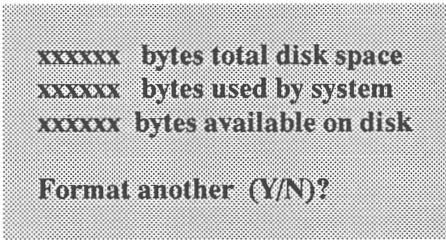
After loading this command from the diskette into the system memory, the monitor will display the following messages:

**Insert new diskette for drive B
and strike ENTER when ready**

Now insert a new diskette into drive B, close the drive door then press **"RETURN"** key. Make sure you have already read the notes in this section.

If the system you own is a one-floppy system, please remove the system diskette from drive A and insert a blank diskette into it. Close the drive door and press **"RETURN"**.

After formatting is completed, the following messages appear on the screen:



```
xxxxxx bytes total disk space
xxxxxx bytes used by system
xxxxxx bytes available on disk

Format another (Y/N)?
```

The light will go off afterwards.

Press Y or y to repeat this process. Remove the formatted diskette and replace it with a new one, then press **"RETURN"** to continue this procedure.

If you want to stop the process of this command, please press N or n to end the format program and exit to **DOS** system prompt.

OPTIONAL SWITCHES

- /S : This switch will transfer the system files to the formatting diskette. If this switch is not performed, the diskette will not be able to boot up the system.
- /V : This switch will offer you to set the volume name of the diskette. The length of the name must not over 11 characters. You may use the **VOL** command instead later on.

For more information, please refer to the **DOS** manual.

4.7 COPY A FILE

COPY command is a program used to copy file(s) from the source diskette to a destination one.

This command could be used for duplication of either a floppy to a floppy , or a floppy to a hard disk, or sub-directory to sub-directory. You can copy a file with the following format after the system prompt:

A> COPY AAA.DAT B: <-- copy **AAA.DAT** from
 DRIVE A to **B**

OR

A> COPY B:AAA.DAT C:BBB.DAT <-- copy **AAA.DAT** from
 DRIVE A to
 DRIVE C
 and change the
 name to **BBB.DAT**

OR

A> COPY C:BBB.DAT <-- copy **BBB.DAT** from
 DRIVE C to **DEFAULT**
 DRIVE A

After the three procedures, the diskette in drive A will have at least two files - **AAA.DAT** and **BBB.DAT**. File **AAA.DAT** originally exists in the drive A diskette and file **BBB.DAT** actually is the same file as **AAA.DAT** since it was created during the **COPY** process and subsequent copying from drive A to drive B and drive C and back.

CAUTION :

DO NOT copy files to the destination diskette if an existing file in the destination diskette has the same name. Otherwise, the original data of that file will be destroyed.

The format of **COPY** command as follows:

COPY <d:> <Pathname> <Filename> <d:>
<Pathname> <filename>

Every time you input a wrong format, the error message will come out. Such as:

' File cannot be copied onto itself '

It means that you did not assign a destination. Therefore you must add in the destination. For example:

```
A> copy a:hello.dat          <-- missing destination
File cannot be copied onto itself <-- error message
```

```
0 File(s) copied
```

```
A> copy a:hello.dat c:hi.dat  <-- correction
```

```
1 File(s) copied
```

With the right format, you can make any copy that you want.
But do not forget to remove the write-protect tab of the
destination diskette before you do it.

4.8 COPY FILES

With the wildcards - '?' and '*', you can make '**COPY FILES**' more easily. Especially when you copy several files with some common characters.

The '?' in a file name or in a file name extension indicates that any character can occupy that position. For example,

A> copy data.? b:

copies all files with the file name **DATA** and a one or no character extension on drive A to drive B.

The other special character - '*' indicates that any character can occupy the position and all the remaining positions in the file name or extension. For example,

A> copy b:d*.*

copies all the files with the file name beginning with 'd' from drive B to drive A. So what will probably happen is that all the following files will be copied to **DEFAULT** drive A from drive B.

dBASE.com
DIR.COM
data.dat
Dial

It does not matter if characters are in lower or upper case, the system will accept them as the same.

4.9 LISTING FILES

Sometimes we'll forget the files included in the diskette or the hard disk, therefore the **DIR** command will help you to find out what and where the files are.

To list all the files on the diskette in the default drive, you can simply type "**DIR**" then press "**RETURN**" right after the system prompt. The monitor will display a list of files including the filenames, extensions, the size that each file occupies, the date and time that the files were last created or modified. At the end, the information of unused spaces will also be shown.

The file information are shown in a scrolling mode, that is, displaying the files one by one and moving the first line upward to display the next line.

Perhaps the scrolling is too fast for reading, you may slow down the scrolling speed by using the switch "**/P**". This switch "**/P**" will display the files one page at a time, then hold the screen until you press a key. To use this function, you need to type

dir /P

, then press "**RETURN**". Now the monitor is showing all the information contained on the diskette in the **DEFAULT** drive.

" **DIR/W** " will enable the directoryfiles to be displayed across the screen in a "**WIDE** " mode. It will however, omit information of the date of the file last modified and the size of the files.

The other function of the **DIR** command is to search particular files. The common format of searching a file is:

dir <d:> [filename]

where d is the drive name and the filename is the name of the file included on the diskette.

For the way of searching more than one file with common character(s), please refer to 4.6 and use the **WILDCARDS**.

4.10 RENAME A FILE

With the **RENAME** command, you can change the filename of an existing file into another which may be more convenient to remember.

The syntax is:

RENAME OLD name.ext **NEW** name.ext

or

REN OLD name.ext **NEW** name.ext

Note that the new filename must not conflict with the name that already exists on the diskette, or you'll see the message as follows:

Duplicate file name or file not found

To rename a file which is not existing on the diskette in the default drive, you can change the default drive first or add the drive's name before the filename.

4.11 TO ERASE FILES

To ensure that the files on the diskette are of the latest information, you'll probably need to omit older useless files. The **ERASE** and **DEL** commands provide the function of erasing the unnecessary file(s) on the diskette. The following example shows how to use this command.

```
ERASE <d:> filename.ext
```

or

```
DEL <d:> filename.ext
```

To delete more than one file, you can always use the **WILDCARDS** to do it. For example to delete all the files on the diskette, type:

```
ERASE *.*
```

You'll be asked for confirmation:

```
Are you sure (Y/N)?
```

Then press Y if you really want to erase all the files on the diskette, or N if you want to change your mind.

4.12 BACK UP DISK

It is strongly recommended that you make backup copies of all your disks. If a disk becomes damaged or if files are accidentally erased, you will still have all the information on your backup disk. You should make a backup copy of your **MS-DOS "DISKCOPY"** command.

The **DISKCOPY** command copies the contents of a disk onto another disk. You can use this command to duplicate both the **MS-DOS** disk and a disk that contains your own files. **DISKCOPY** is the fastest way of copying a disk because it copies the entire disk in one operation, including **MS-DOS** system files if they exist.

The syntax of the **DISKCOPY** command is:

DISKCOPY [drive1:] [drive2:]

Drive 1 is the disk drive that contains the source diskette that you want to copy from; **drive 2** is the disk drive that contains the formatted diskette to copy to.

For example, if you want to make a copy of your **MS-DOS** disk which is in drive **A:**, type

DISKCOPY A: B:

MS-DOS responds:

**Insert source diskette into drive A:
Insert target formatted diskette into drive B:
Strike any key when ready.**

Make sure the **MS-DOS** disk is into drive **A:** and insert a formatted or empty diskette into drive **B:**. Press any character key and **MS-DOS** will begin copying the **MS-DOS** disk. After **MS-DOS** has copied the disk, **MS-DOS** displays :

Copy complete

Copy another (Y/N)?

Type **Y** (for Yes) if you wish to copy another disk with **DISKCOPY**. If you type **N** (for No), The default drive prompt is displayed.

You now have a duplicate copy of your **MS-DOS** disk in drive B:. This duplicate copy can be saved as your backup copy of the **MS-DOS** disk.

Note:

1. If you omit both options, a single-drive copy operation will be performed on the default drive.
2. If you omit the second option, the default drive will be used as the destination drive.
3. Both disks must have the same number of physical sectors and those sectors must be of the same size.

4.13 CHECK DISK

The **MS-DOS** command **CHKDSK** is used to check your disks for consistency and errors, much like a secretary proofreading a letter. **CHKDSK** analyzes the directories and the File Allocation Table on the disk that you specify. It then produces a status report of any inconsistencies, such as files which have a non-zero size in their directory but really have no data in them.

The Syntax of the **CHKDSK** command is:

CHKDSK [d:] [/F] [/V]

CHKDSK should be occasionally runned on each disk to check for errors in the directory. If any errors are found, **CHKDSK** will display error messages, and then a status report.

A sample status report as follows:

```
1213952bytes total disk space
 36864bytes in 2 hidden files
  512bytes in 1 directory
 30720bytes in 8 user files
1145856bytes available on disk

524288bytes total memory
485072bytes free
```

CHKDSK will not correct the errors found in your directory unless you specify the **/F (fix)** switch. Typing **/V** causes **CHKDSK** to display messages while it is running.

4.14 CHANGE DIRECTORY

You can find out the name of the directory you are in by issuing the **MS-DOS** command **CHDIR** (**Change Directory**) with no options. The syntax of the **CHDIR** command is:

CHDIR [pathname]

For example, if your current directory is **USER SMITH** in drive **A**;, when you type :

A > CHDIR

You will see:

A:\USER\SMITH

This is your current drive designation plus the working directory (USER\SMITH). If you want to change your working directory to another directory (such as \USER\SMITH\FORMS), type :

CHDIR \USER\YAO\FORMS

and **MS-DOS** will put you in the new directory. A shorthand notation is also available with this command :

CHDIR ..

This command will always put you in the parent directory of your working directory. You can also type **CD** for the **CHDIR** command.

4.15 CREAT DIRECTORY

To create a subdirectory in your working directory, use the **MKDIR (Make Directory)** command. The syntax of the **MKDIR** command is :

MKDIR <pathname>

For example, to creat a new directory named **NEWDIR** under your working directory, simply type :

MKDIR NEWDIR

After this command has been executed by **MS-DOS**, a new directory will exist in your tree structure under your working directory. You can also make directories anywhere in the tree structure by specifying **MKDIR** and then a pathname. You can also type **MD** for **MKDIR** command.

4.16 REMOVE DIRECTORY

To delete a directory in the tree structure, use the **RMDIR (Remove Directory) command**. The syntax of the **RMDIR** command is :

RMDIR <pathname>

For example, to remove the directory **NEWDIR** from the working directory, type :

RMDIR NEWDIR

Note that the directory **NEWDIR** must be empty except for the **.** and **..** entries before it can be removed; this will prevent you from accidentally deleting files and directories. You can remove any directory by specifying its pathname. To remove the **\BIN\USER\ LEE** directory, make sure that it has only the **.** and **..** entries, then type :

RMDIR \BIN\USER\LEE

To remove all the files in a directory (except for the . and .. entries), type **DEL** and then the pathname of the directory. For example, to delete all files in the \BIN\USER\LEE directory, type :

DEL \BIN\USER\LEE

You cannot delete the . and .. entries. They are created by **MS-DOS** as part of the hierarchical directory structure. You can also type **RD** for the **RMDIR** command.

4.17 SET CLOCK and CALENDAR

The **LEO 386 System** has an internal real-time 24-hour clock that is tied to a calendar. As long as you leave the computer on, the clock continues to run. The date, month and year is programmed follows real time. But reloading **MS-DOS** clears the time and date and you must enter a new date and time to be used on disk directories.

You can examine and set the date and time whenever you want with the **DATE** and **TIME** commands. To use either command, simply type it in and press the **ENTER** key. The computer displays the current date or time and asks you for a new date or time. You may enter nothing and just press the **ENTER** key to keep the current date or time unchanged. The syntax of the **DATE** and **TIME** command are :

DATE [**<mm>** - **<dd>** - **<yy>**]
TIME [**<hh>** : **<mm>**]

The following example shows how to use the **DATE** and **TIME** commands:

```
A >date  
Current date is Sun 8-01-1984  
Enter new date: 7-5-88
```

```
A >time  
Current time is 10:43:38.70  
Enter new time: 17:15
```

```
A> _
```

4.18 DISPLAY FILE CONTENTS

The **TYPE** command displays the contents of any file on the monitor screen. The syntax of **TYPE** command is :

TYPE <filespec>

The drive designation prefix is optional if the file is on the default drive. You can use the **PrtSc** key together with the **Ctrl** or **Shift** keys to send displayed output to the printer.

You will only be able to read files that contain text, like word processing files, some data files, and parts of some program files. This is because program instructions are usually stored on disk in binary form. Note that a display of binary files causes control characters (such as **CONTROL-Z**) to be sent to your computer, including bells, form feeds, and escape sequences.

If you want to know more, the **MS-DOS Operating System User's Guide** gives more details on **MS-DOS** commands.

4.19 UTILITIES

FDISK

If your **LEO 386 SYSTEM** has a fixed disk, you must prepare the fixed disk with a utility, **FDISK.COM**, before **MS-DOS** can use it. If not, the screen will display this message :

Invalid drive specification

You can use **FDISK** to :

- **create MS-DOS partition**
- **change active partition**
- **delete MS-DOS partition**
- **select fixed disk drive**

To start **FDISK**, type :

A > FDISK

**Fixed Disk Setup Program Version 0.02
(C) Copyright Microsoft, 1985**

FDISK Options

Choose one of the following :

- 1. Create DOS Partition**
- 2. Change Active Partition**
- 3. Delete DOS Partition**
- 4. Display Partition Data**

Enter choice: [1]

Press ESC to return to DOS

DISKCOMP

If you want to compare the contents of the diskette in the first specified drive with that of the diskette in the second specified drive, you can use **DISKCOMP** utility.

The **DISKCOMP** command is used to compare two entire diskettes. If a fixed disk drive letter is specified, an error message is displayed. The **COMP** command compares two lists of files.

The syntax of the **DISKCOMP** utility is :

DISKCOMP [d:] [d:] [/1] [/8]

Where :

- [d:]** - to specify the source drive
- [d:]** - to specify the target drive
- /1** - to compare only the first side of the diskette, even if the diskettes and drives are double side.
- /8** - to compare only 8 sectors per track. The diskette should not be high capacity with 1.2M bytes.

You can specify the same drive or different drives in this command. If you specify the same drive, a one-drive comparison is performed. You are prompted to insert the diskettes at the appropriate time. **DISKCOMP** waits for you to press any key before it continues.

Ex 1.

A > diskcomp a: b:

Insert FIRST diskette in drive A:

Insert SECOND diskette in drive B:

Press any key when ready.....

Ex 2.

B > diskcomp a: a:

Insert FIRST diskette in drive A:

Press any key when ready.....

Comparing 80 tracks, 15 sectors per track, 2 sides

Insert SECOND diskette in drive A:

Press any key when ready.....

KEYB

You can use **KEYB** utility to load a keyboard program to replace the keyboard program resident in ROM BIOS.

The syntax of **KEYB** utility is

KEYB [xx[, [yyy], [[drive:][path]filename]]]

WHERE :

- xx** - is a two-letter keyboard code.
- yyy** - is the code page which defines the character set.
- filename** - is the name of the keyboard definition file.

Comments:

- xx** - is one of the following two-letter codes:

Code	Keyboard Type	Command
us	United States	keyb us (default)
fr	France	keyb fr
gr	Germany	keyb gr
it	Italy	keyb it
sp	Spain	keyb sp
uk	United Kingdom	keyb uk
po	Portugal	keyb po
sg	Swiss-German	keyb sg
sf	Swiss-French	keyb sf
dk	Denmark	keyb dk
be	Belgium	keyb be
nl	Netherlands	keyb nl
no	Norway	keyb no
la	Latin America	keyb la
sv	Sweden	keyb sv
su	Finland	keyb su

If you type **keyb** without options, **MS-DOS** displays a message like following to show the current keyboard code and its related code page, and the current code page used by your console screen device (CON):

Current keyboard code : FR Code page: 437
Current CON code page : 437

You can switch from the **keyb** program to the default (**United States**) keyboard format at any time by pressing **CONTROL-ALT-F1**. You can then return to the memory-resident keyboard program by pressing **CONTROL-ALT-F2**.

The **keyb** command lets you use characters that are not part of the normal (QWERTY) keyboard format. Using the **keyb** command with one of the two-letter codes above, you can type commands or text to **MS-DOS** using either the standard keyboard or a special keyboard.

Note that the characters that appear on your screen when you type on a standard keyboard do not necessarily match the label on the key. You can produce some characters in the non --- United States keyboard sets by pressing **CONTROL-ALT** along with an appropriate character key. To produce accented (and umlauted) characters, you press *dead keys*. Dead keys are keys that do not display a character when used alone, but when followed by a letter, display that letter with an accent.

Note :

You can also include the appropriate **keyb** command in your *autoexec.bat* file so that you won't have to type it each time you start **MS-DOS**.

Examples:

To use a German keyboard, type the following command:

keyb gr

GRAPHICS

GRAPHICS utility allows the contents of a graphics display screen to be printed out onto a printer when using a color/graphics monitor adapter.

The syntax of the **GRAPHICS** utility is :

GRAPHICS [printer type] [/R] [/B] [/P=port] [/lcd]

Press the **Shift-PrtSc** keys to print the screen contents onto the printer.

Where :

[printer type] Is to specify the type of printer you are using.
If you do not specify a printer type, then the default is the **GRAPHICS**.

You can choose from the following types :

COLOR1	Color printer with black ribbon
COLOR4	Color printer with red, green, blue, or black
COLOR8	Color printer with cyan, magenta, yellow, or black ribbon
COMPACT	Compact printer
GRAPHICS	Graphics printer
THERMAL	Prints on an IBM PC-convertible.

If you do not specify the printer option, graphics defaults to the GRAPHICS printer type.

- [/R]** Prints black and white (as seen on the screen) on the printer. The default is to print black as white and white as black.
- [/B]** Is to print the background color. The parameter is only for printer types COLOR4 and COLOR8. If you do not specify /B, the default is not to print the background color.
- [/p = port]** Sets the parallel printer port that graphics sends its output to when you press the **SHIFT-PRINT SCREEN** key combination. The port may be set to 1, 2, or 3; the default setting is 1.
- /lcd** Prints from the **LCD** (liquid crystal display) on the IBM PC-Portable computer.

To print the screen, press the **SHIFT** and **PRINT SCREEN** keys at the same time. If the computer is in 320X200 color graphics mode, and if the printer type is **COLOR1** or **GRAPHICS**, **graphics** prints the screen contents with up to four shades of gray. If the computer is in 640X200 color graphics mode, **graphics** prints the screen contents sideways on the paper.

Note :

The graphics comand increases the size of **MS-DOS** resident in memory.

Examples :

to print a graphics screen on your printer, type the following command:

GRAPHICS

Then, when the screen displays the information you want to print, press the **SHIFT** and **PRINTSCREEN** keys at the same time.

PRINT

You can use the **PRINT** utility to print a list of data files on the printer while you are simultaneously doing other tasks on the computer.

The syntax of the **PRINT** utility is :

```
PRINT [/D:device]
[ /B:buffsiz]
[ /U:busytick]
[ /M:maxtick]
[ /S:timeslice]
[ /Q:quesiz]
[/C] [/T] [/P]
[d:] [path] [filename] [.ext].....
```

Where :

[/D:device] is to specify the print device. If not specified, the default device PRN is assumed. Only specify this parameter the first time you PRINT.

[/B:buffsiz] is to set the byte size of the internal buffer. The default value is 512 bytes. Increasing the value of B may enhance the performance of the PRINT command. Only specify the parameter the first time you use PRINT.

[/Q:quesiz] is to specify how many print files you can have in the queue. The range of values is from 1 to 32 files. The default value is 10. Only specify this parameter the first time you use PRINT.

[/S:timeslice] is to specify the timeslice value. The default is 8 timeslices. The range of values is 1 to 255. Only specify this parameter the first time you use PRINT.

[/U:busytick] is to specify the number of clock ticks that PRINT will wait until the print device is available. The default value for busytick is 1. If PRINT waits longer than U busytick, it gives up its time slice. Only specify this parameter the first time you use PRINT.

[/M:maxtick] is to specify how many clock ticks PRINT has to print characters onto the print device. The default value for maxticks include the range of values from 1 to 255 maxticks. Only specify this parameter the first time you use PRINT.

[/C] is to set the cancel mode. Allows you to select which file or files to cancel. The preceding filename and all following filenames entered on the command line are cancelled from the print queue until a /P is found on the command line, or until you press the ENTER key.

[/T] is to set terminate mode. All queued files are cancelled from the print queue. If a file is currently being printed, the printing stops, a cancellation message is printed, the paper is advanced to the next page, and the printer's alarm sounds off.

[/P] is to set the print mode. The preceding filename and all the following ones are added to print queue until a /C is found on the command line, or until you press the ENTER key.

Notes :

1. The disk containing the files being printed must remain in the specified drive until all printing is complete. Any file in the print queue must not be altered or erased until after it has been printed.
2. The printer cannot be used for any other purpose while PRINT has data to print. Any attempt to use the printer (**Shift-PrtSc**, **LLIST**, **Ctrl-PrtSc**, **LPRINT**, etc.) results in an "out-of-paper" indication until all files have been printed or printing has been terminated (/T).

In this example, the **PRINT** command is being used for the first time since the system was started.

The command: **Aprint a:test1.tst** has just been entered, **MS-DOS** responds with :

name of list device [PRN] :

Press the **ENTER** key to send output to the printer. It then adds the file **TEST1.TST** from drive A to the print queue and sends the output to the device "**PRN**" printer.

The command : `A > print / t`
empties the print queue. All further information on the line
is ignored.

The command : `A > test.* / C`
removes all `TEST.???` files from the print queue that have
the same drive letter as the default drive.

TREE

The **TREE** utility is used to display all the directory paths found on the specified drive and optionally lists the files in each subdirectory.

The syntax of the **TREE** utility is :

TREE [d:] [/F]

Where :

[d:] for drive specification. If the parameter is omitted, then the default drive is assumed.

[/F] for an option for listing files in each subdirectory. If the parameter is used, the names of all files in each subdirectory will be displayed.

For each directory found, its full path name will be displayed right along with the names of any subdirectory.

MODE

The **MODE** utility is used to set the way that a serial/parallel card, or the color graphic adapter operates.

The syntax of the **MODE** utility in setting the printer is :

MODE LPT# [:] [n] [, [m] [,p]]

Where :

- | | |
|----------|--|
| # | - is 1, 2, or 3. (printer number) |
| n | - is 80 or 132. (characters per line) |
| m | - is 6 or 8. (lines per inch vertical spacing) |
| p | - specifies retry on time-out errors. |

The syntax in setting the color graphic adapter is :

MODE n

or

MODE [n], m[T]

Where :

- | | |
|----------|--|
| n | - is 40, 80, BW40, CO40, CO80, or MONO. |
| m | - is R or L. (shift display right or left) |
| T | - requests a test pattern used to align the display. |

The syntax to set serial communication is :

MODE COMn [:] baud [,parity[,databits[,stopbits[,p]]]]

Where :

- | | |
|-----------------|--|
| n | - either 1 or 2 (serial port number) |
| baud | - 110, 150, 300, 600, 1200, 2400, 4800, or 9600
(only the first two characters are required.) |
| parity | - either N (none), O (odd), or E (even).
Default is E. |
| databits | - either 7 or 8. Default is 7. |
| stopbits | - either 1 or 2. Default is 1. |

A: HARD DISK

APPENDIX A

HARD DISK

A.1 THE HARD DISK CARE

The hard disk is the most sensitive part of the whole system. Before the installation, please **DO** keep the following notes in mind.

Note:

1. **DO NOT** shake the system no matter whether the system power is on or off.
2. Always put the system which contains a hard disk on a clean and stable surface.
3. **DO NOT** shake the hard disk in any situation as this will destroy the precious data that you kept for a long time.

A.2 HARD DISK INSTALLATION

Running different softwares, sometimes you will need a larger working area. The hard disk, however, is the most common way to support this function. This section provide you the procedures of how to install a hard disk. Please follow the procedures step by step to prevent unnecessary damages.

PROCEDURES:

1. **TURN OFF** the system unit's power on the front panel and all the external powers of peripherals attached to the system unit.
2. Unplug the power cord and disconnect all the cables from the rear panel of the system unit. **REMEMBER** to make a note of where they were connected previously.
3. Carefully position the tower case on its side with the floppy disk drive is on the right side while you face the front panel.
4. Remove the five mounting screws on the rear panel and save the screws in a little bag in order to reinstall the system.

5. Carefully pull up the top cover of the system unit from about 15 degrees then gently slide the cover toward the rear part of the system. If the cover is still tightened to the case, please rock it as gently as you can until it is released from the case itself.
6. Gently remove the six mounting screws behind the front panel as shown in the picture below, then you can take off the front panel.
7. With the floppy-disk drive(s) on the right, you will find two bays for two half-height **HDDs** which can also fit the space for one full-height **HDD**.
8. Fasten the hard disk and the slide with two screws on each side of the hard disk.
9. Select either bay for **HDD** and gently slide the **HDD** into the case.
10. Plug in the hard disk control cable from the hard disk controller. Notice that the color-strip must connect with pin 1 of the golden finger.
11. Plug in the power connector from the power supply.

12. Make sure the hard disk properly fits into the case.
Fasten your **HDD** to the cabinet by driving the **HDD** screws into the cabinet.
13. Put the front panel on the cabinet and fasten the six mounting screws.
14. Check the wires and cables in the system to ensure that they will not be hurt by the cover or block any vent holes.
15. **GENTLY** slide the top cover back to the system unit and secure it with the five mounting screws that you saved.
16. Reconnect all the connectors and cables of the peripherals to the system unit.
17. Reconnect the power cord to both ends of the system unit and the outlets.

A.3 CONFIGURING A HARD DISK

After installing the hard disk, you'll come to the next and the most important step in this chapter. Since there are so many different types of hard disks available in the market, how can the system recognize the specification of the hard disk? This section will show you how to configure your hard disk properly to ensure your system will recognize it.

Note :

Because the following procedures will destroy all the data in the hard disk, **BE SURE** that the hard disk that you plan to perform preformat is empty.

FORMAT THE HARD DISK

You can format the hard disk in many different ways. However, here we suggest you to use the **DISK MANAGER** that is programmed by **ONTRACK**. The following is a brief procedure of how to use this program to format your hard disk.

Note :

DISK MANAGER is capable of dealing with hard disk drives which are not specifically provided by the **ROM BIOS**. **DISK MANAGER** refer to these drives as **NON-STANDARD** types and define these drives with different configuration files. The configuration files for some common disk drives supplied by **DISK MANAGER** are:

FILE	MANUFACTURER/MODEL	CAPACITY
CDC18	CONTROL DATA 94155-30	17.7MB
CDC30	CONTROL DATA 94155-36	29.6MB
CDC32	CONTROL DATA 94155-38	31.1MB
CDC40	CONTROL DATA 94155-48	39.3MB
CDC42	CONTROL DATA 94205	42.0MB
CDC55	CONTROL DATA 94155-67	55.0MB
CDC70	CONTROL DATA 94155-86	70.7MB
FUJ55	FUJITSU M2242AS	44.8MB
FUJ86	FUJITSU M2243AS	70.5MB
HITACH51	HITACHI DK511-5	42.4MB
HITACH86	HITACHI DK511-8	69.9MB
MAX1065	MAXTOR XT-1065	54.6MB
MAX1085	MAXTOR XT-1085	69.6MB
MAX1105	MAXTOR XT-1105	85.8MB
MAX1140	MAXTOR XT-1140	117.0MB
MAX2190	MAXTOR XT-2190	130.6MB
MIC1324	MICROPOLIS 1324	52.2MB
MIC1325	MICROPOLIS 1325	69.6MB
4 MIN6085	MINISCRIBE 6085	69.6MB
NDR1065	NEWBURY DATA 1065	54.6MB
NDR1085	NEWBURY DATA 1085	69.6MB
NDR1105	NEWBURY DATA 1105	85.8MB
NDR1140	NEWBURY DATA 1140	117.0MB
NDR2190	NEWBURY DATA 2190	130.6MB
NEC5146	NEC D5146	41.8MB

FILE	MANUFACTURER/MODEL	CAPACITY
PRIAM42	PRIAM	41.7MB
PRIAM60	PRIAM	58.4MB
ST213	SEAGATE ST213	10.5MB
ST225	SEAGATE ST225	20.9MB
ST238	SEAGATE ST238	20.9MB
ST251	SEAGATE ST251	41.8MB
ST277	SEAGATE ST277	61.0MB
ST4026	SEAGATE ST4026	20.9MB
ST4038	SEAGATE ST4038	31.1MB
ST4051	SEAGATE ST4051	41.5MB
ST4096	SEAGATE ST4096	78.3MB
TAN755	TANDON TM755	41.7MB
TOSHMK53	TOSHIBA MK53	35.3MB
TOSHMK54	TOSHIBA MK54	49.4MB
TOSHMK56	TOSHIBA MK56	70.6MB
VER170	VERTEX V170	58.7MB
VER185	VERTEX V185	60.9MB

BRIEF PROCEDURES:

1. Find the code number of your drive type that is listed above.
2. Run the setup program and set up the type of the drive.
3. Boot up your system with DOS diskette from drive A.
4. When DOS prompt "A" is shown on the screen, remove DOS diskette and insert the **DISK MANAGER** diskette.
5. Type "**DM**" then press "*RETURN*" key.
6. Key in "**C**" while the menu of the disk manager appeared and press "*RETURN*" key.
7. Key in "**N**" then press "*RETURN*" key.
8. Key in the configuration file name listed above which matches with your drive model then press "*RETURN*" key.
9. Key in "**W**" then press "*RETURN*" key.
10. Key in "**Y**" then press "*RETURN*" key.
11. Key in "**R**" then press "*RETURN*" key.
12. Key in "**S**" then press "*RETURN*" key.

13. Key in " 1 " then press " RETURN " key.
14. Key in " I " then press " RETURN " key.
15. Key in " I " then press " RETURN " key.
16. Key in " Y " then press " RETURN " key.
17. Key in " D " then press " RETURN " key.
18. Key in " 3 " then press " RETURN " key.
19. Key in " Y " then press " RETURN " key.
20. Key in " R " then press " RETURN " key.
21. Key in " P " then press " RETURN " key.
22. Key in " Y " then press " RETURN " key.
23. Key in " N " then press " RETURN " key.
24. Key in " N " then press " RETURN " key.
25. Key in " A " then press " RETURN " key.
26. Key in " 1 " then press " RETURN " key.
27. Key in " D " then press " RETURN " key.
28. Key in " 0 " then press " RETURN " key.

29. Key in " 20 " then press " RETURN " key.
30. Key in " A " then press " RETURN " key.
31. Key in " 2 " then press " RETURN " key.
32. Key in " W " then press " RETURN " key.
33. Key in " 20 " then press " RETURN " key.
34. Key in " 9999 " then press " RETURN " key.
35. Key in " R " then press " RETURN " key.
36. Key in " Y " then press " RETURN " key.
37. Key in " P " then press " RETURN " key.
38. Key in " Y " then press " RETURN " key.
39. Key in " Y " then press " RETURN " key.
40. Key in " Y " then press " RETURN " key.
41. Key in the volume name then press " RETURN " key.
42. When **"INSERT YOUR DOS SYSTEM DISKETTE IN DRIVE A"** appeared on the screen, remove the **DISK MANAGER** diskette from drive A and insert your **SYSTEM** diskette in drive A then press " RETURN "key.

43. When **"INSERT YOUR DISK MANAGER DISKETTE IN DRIVE A"** appeared on the screen, remove the **DOS SYSTEM** diskette from drive A and insert the **DISK MANAGER** diskette in drive A then press **"RETURN"** key.
44. Key in **"N"** then press **"RETURN"** key.
45. Key in the volume name if you need then press **"RETURN"** key.
46. Key in **"R"** then press **"RETURN"** key three times.
47. Boot up your system with **DOS** diskette in drive A.
48. After the system prompt **"A"** type **"SYS C:"** then press **"RETURN"** key.
49. Remove the **DOS** diskette from drive A and restart the system, now you can boot up the system directly from the hard disk.

A.4 HARD DISK TYPE TABLE

Following table are the hard disk drive parameters of PHOENIX BIOS.

DRV TYPE	CYL	HD	WRITE PRECOMP	LANDING ZONE	SECTORS	MEGA BYTE
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	640	6	512	640	17	46
6	615	4	-1	615	17	20
7	462	8	256	511	17	30
8	733	5	-1	733	17	30
9	900	15	-1	901	17	112
10	820	3	-1	820	17	20
11	855	5	-1	855	17	35
12	855	7	-1	855	17	49
13	306	8	128	319	17	20
14	733	7	-1	733	17	42
16	612	4	0	663	17	20
17	977	5	300	977	17	40
18	977	7	-1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0	336	17	10
25	615	4	0	615	17	20

DRV TYPE	CYL	HD	WRITE PRECOMP	LANDING ZONE	SECTORS	MEGA BYTE
26	1024	4	-1	1023	17	34
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	68
29	512	8	256	512	17	34
30	615	2	615	615	17	10
31	989	5	0	989	17	41
32	1020	15	-1	1024	17	127
35	1024	9	1024	1024	17	76
36	1024	5	512	1024	17	42
37	830	10	-1	830	17	68
38	823	10	256	824	17	68
39	615	4	128	664	17	20
40	615	8	128	664	17	40
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	823	10	512	823	17	68
44	820	6	-1	820	17	40
45	1024	8	-1	1024	17	68
46	925	9	-1	925	17	69
47	699	7	256	700	17	40
48	0	0	0	0	0	0
49	0	0	0	0	0	0

APPENDIX B

MAP

B.1 MEMORY MAP

The following is a list of system memory map. It is the fully compatible with **IBM AT(*)** system, this map is just the same as the **IBM AT(*)**.

	MEMORY SIZE	MEMORY TYPE
0 - 9FFFF	640KB	SYSTEM MEMORY
A0000 - DFFFF	256KB	RESERVED FOR SYSTEM OPERATIONS
E0000 - FFFFF	128KB	ROM/RAM BIOS
100000 - FFFFFFFF	15MB	EXTENDED MEMORY

B.2 I/O MAP

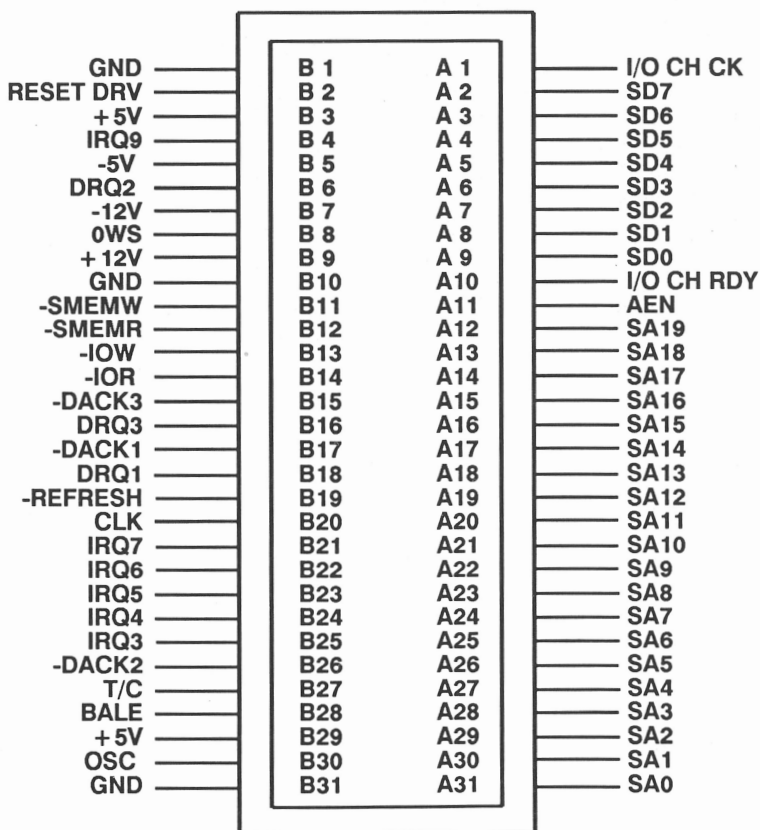
The following table is the mapping of the system I/O.

I/O ADDRESS	I/O DEVICE
00 - 1F	DMA, SLAVE
20 - 3F	INTERRUPT CONTROLLER, SLAVE
40	TIMER
60, 64	KEYBOARD CONTROLLER
63	RAMBIOS (WRITE "1" TO ENABLE, WRITE "0" TO DISABLE)
70, 71	REAL-TIME CLOCK
70 (BIT7)	NMI MASK
80 - 9F	DMA PAGE REGISTER
A0 - BF	INTERRUPT CONTROLLER, MASTER
C0 - DF	DMA, MASTER
F0 - FF	MATH COPROCESSOR
1F0 - 1F8	FIXED DISK
200 - 207	GAME I/O
278 - 27F	LPT2
2F8 - 2FF	COM2
378 - 37F	LPT1
380 - 38F	SDLC, BISYNCHRONOUS 2
3A0 - 3AF	BISYNCHRONOUS 1
3B0 - 3BF	MONOCHROME DISPLAY AND PRINTER ADAPTER
3D0 - 3DF	COLOR/GRAPHICS MONITOR ADAPTER
3F0 - 3F7	DISKETTE CONTROLLER
3F8 - 3FF	COM1

B.3 I/O CHANNEL CONNECTORS

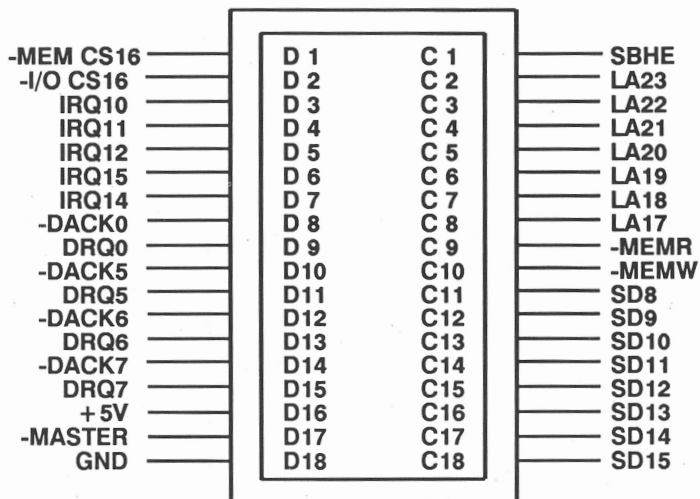
8-BIT CHANNELS

Rear Panel

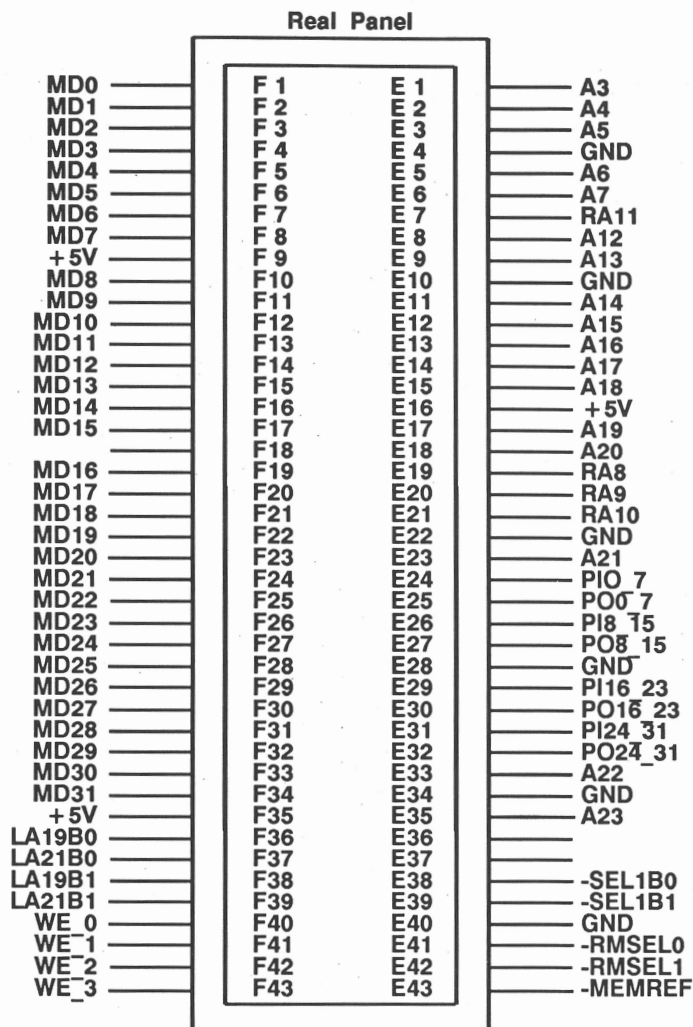


16-BIT CHANNELS

Real Panel



32-BIT CHANNELS



APPENDIX C

ADAPTER

C.1 ADD-ON ADAPTER INSTALLATION

LEO 386 supports many different types of add-on adapters such as the RAM card, display card, etc..

To install the adapters, please follow the procedures in the below :

1. **TURN OFF** the system unit's power on the front panel and all the external powers of peripherals attached to the system unit.
2. Unplug the power cord and disconnect all the cables from the rear panel of the unit.
REMEMBER to make a note of where they were connected.
3. Carefully position the tower case on its side with the floppy disk drive is on the right side while you face the front panel.
4. Remove the five mounting screws in the rear panel and save the screws in a little bag for convenience when re-installing the system.

5. Carefully pull up the top cover of the system unit about 15 degrees then gently slide the cover toward the rear part of the system. If the cover is still tightened to the case, please rock it as gently as you can until it releases from the case itself.
6. With the front panel towards you, there are expansion slots on the upper left of the system board.
Before you install the adapters, please check the slots that you intend to use to see which slot is best utilized.
7. Remove the bracket from the unused expansion slot which you have chosen to install your expansion adapter. Save the bracket for later use and use the screw for installation of the adapter.
8. Check if any switch or jumper need to be reset or changed on the adapter according to the installation guide of the adapter. Make sure that the settings have been properly set as instructed.
9. With the component side of the adapter facing the power supply, gently insert the adapter into the on-board slot with the card guides leading the direction.
Press the top of the adapter to ensure the card is inserted into the slot. **DO NOT** use too much force when inserting the card into the slot to avoid any damage to the card. If necessary, rock the card up-and-down slowly into the slot. Fasten the adapter with the screw that you removed out from the bracket.

10. If the adapter that you installed should be altered, the system configuration, i.e., color display card instead of monochrome display card, please reconfigure it with the **SETUP** program.
11. Check the wires and cables in the system to ensure that they will not be hurt by the cover or block any vent holes.
12. **GENTLY** slide the cover back to the system unit and secure it with the five mounting screws that you saved.
13. Reconnect all the connectors and cables of the peripherals to the system unit.
14. Reconnect the power cord to both ends of the system unit and the outlets.

APPENDIX D

TROUBLE SHOOTING

D.1 BASIC TROUBLE SHOOTING

- **Turn on the power and the fan doesn't work.**
 - (1) Reconnect both terminators of power cord properly.
 - (2) Source power has no output voltage.
(Try Another Set)
 - (3) Power supply fuse is burnt out.

- **Fan works after power on but LED of front panel does not light up.**
 - (1) Check and reconnect the connector between LED and mother board.
 - (2) Check and reconnect the power connector between mother board and power supply.
 - (3) Turn off all power of other peripherals to make sure that peripherals did not short the power.
 - (4) Take off add-on cards one at a time to make sure if there was any card that made the power short.
 - (5) Check all screws on mother board. Make sure that they won't short the power.
 - (6) Repeat all steps of question 1.

- **Power on but keyboard cannot work.**
 - (1) Reconnect keyboard connector to system unit.
 - (2) Check if the AT/XT switch under the keyboard are in right position.
 - (3) Change a keyboard to make sure if the keyboard works fine.

- After initialization, FDD doesn't work.

- (1) Check if the cable between FDC and FDD are correct.
- (2) Reconnect power connector properly.
- (3) Check if there was any damage on the cable.
- (4) Make sure that FDC matches with FDD.
- (5) Check if the first FDD was connected with the terminal connector of the cable.
Check the DIP switch of FDC if any.
- (6) Check if drive A had terminator on it.
- (7) Change a FDC.
- (8) Change a FDD.

- After power on, system can't boot.

A. System with two FDD only.

- (1) If the LED of FDD lights up improperly.
Please clean the R/W head of FDD first then repeat all procedures of question 4.
- (2) If the LED of FDD lights up Properly.
Please try another diskette that contains bootable system.
Then repeat all steps of question 4 and clean the R/W head of FDD.
- (3) If FDD is still in idle. Then change FDD.

B. System with a hard disk.

- (1) Reconnect cable between HDD and HDC.
- (2) Try another HDC card which is the same type as your present one.
- (3) Set the DIP switch of both HDD and HDC properly.
- (4) Check if the motor of HDD works. If not, swap another HDD.
- (5) The first HDD must be connected with the middle connector of the cable to HDC.
- (6) Make sure you've backup all data on HDD before you do the procedures to preformat the HDD.

● System power on, no display on monitor.

- (1) Reconnect power cord.
- (2) Turn on the power switch of monitor.
- (3) Adjust contrast.
- (4) Adjust brightness.
- (5) Reconnect video connector.
- (6) Make sure the video connector connected with display port properly
- (7) Adjust V-SIZE, H-SIZE.

- Power on, horizontal part can't synchronize with monitor.
 - (1) Adjust H-HOLD, H-PHASE.
 - (2) Make sure the video connector is properly connected with video port properly.
 - (3) Check if the chasis ground of video cable is fine.

- Power on, vertical part can't synchronize with monitor.
 - (1) Adjust V-HOLD.
 - (2) Make sure the video connector connected with video port properly.
 - (3) Check if the chasis ground of video cable is fine without any damage.



FIRST INTERNATIONAL COMPUTER, INC.

6F., FORMOSA PLASTICS REAR BUILDING
201-24, TUNG HWA N. RD.
TAIPEI, TAIWAN, R.O.C.

TEL: (02) 717-4500
TELEX: 23056
FAX: (02) 712-0231

